

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)	
)	
Kropf et al.)	
)	
Serial No.: 10/597,847)	Group Art Unit: 3738
)	
Filed: August 9, 2006)	Examiner: Megan Yarnall Wolf
)	
For: PROSTHESIS FOR REPLACING)	Board of Patent Appeals and
THE SURFACE IN THE AREA OF)	Interferences
THE BALL OF BALL-AND-SOCKET)	
JOINTS)	

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REPLY BRIEF UNDER 37 C.F.R. § 41.41

In response to the Examiner's Answer mailed on April 27, 2009 to the Appeal Brief filed January 21, 2009 and pursuant to 37 C.F.R. § 41.41, Appellants present this Reply Brief in the above-captioned application.

This is an appeal to the Board of Patent Appeals and Interferences from the Examiner's final rejection of claims 18 - 36 and 40 - 42 in the Final Office Action dated September 29, 2008.

I. **Status of the Claims**

Claims 1 - 17 and 37 - 39 have been canceled. Claims 18 - 36 and 40 - 42 stand rejected in the Final Office Action. The final rejection of claims 18 - 36 and 40 - 42 is being appealed.

II. **Grounds of Rejection to be Reviewed on Appeal**

- I. Whether claims 18-42 are unpatentable under 35 U.S.C. § 103(a) as obvious over Sutter et al. (U.S. Patent No. 4,332,036) in view of Latkin (U.S. Published Appln. No. 2003/0163202).

III. **Argument**

In the Examiner's Answer, the Examiner has argued that the sleeve 7 of Sutter may optionally not extend out of the cap 3. (*See* Examiner's Answer, pp. 8 - 9). However, it appears that the Examiner has used only select limitations of the sleeve 7 of Sutter in support of this argument. Specifically, the Examiner states that "Sutter teaches that portion s of the crown is at most 40% of the length of the crown, and this range includes 0%." (*Id.* at p. 8). However, it is respectfully submitted that Sutter teaches several limitations for the sleeve 7 and the distance s, which are meant to be interpreted in combination with one another. The Examiner, on the other hand, has opted to select only one of these limitations with the express intent of overcoming the limitations of claim 18. It is respectfully submitted that the Examiner's interpretation of the sleeve 7 is incorrect as it fails to account for and thus contradicts the limitation of a "free end 7c

of sleeve 7 [that] projects from the interior of the cap by an amount s , that is, beyond the plane extending from an edge 3b of cap 3." (See Sutter, col. 3, ll. 29 - 32). Specifically, the above-recited limitation of Sutter, when interpreted in combination with the limitation of a "distance s [that] is at most 50%, and preferably at most 40% of length L ", describes a sleeve 7 that always abuts out of the cap 3 by a minimum distance s that is bound by an upper limit to prevent intersection with the main vein strand 11g. (*Id.*, See Also col. 4, ll. 20 - 27; Fig. 6).

There are multiple additional recitations in Sutter that support the above-noted interpretation and contradict the interpretation offered by the Examiner. Specifically, Sutter recites "a cap having a calotte-shaped outer surface terminating in a free edge...[and] a sleeve member extending in said concavity and *at least partly beyond said edge.*" (*Id.* at, col. 8, ll. 45 - 63). Sutter also recites that "sleeve 7 protrudes deeper in the femur by the amount s than the latter is embraced by the cap." (See Sutter, col. 6, ll. 25 - 29). Sutter also states that "[i]n prostheses for other joints...the ratios L/D and s/L can be higher," and that "it is particularly advantageous if at least the free end section of sleeve 7 *projecting from the interior of the cap* has a bending resistance which is similar to the bone. (*Id.* at col. 4, ll. 25 - 27; col. 6, ll. 53 - 58). It is therefore evident that all embodiments of the device of Sutter are directed to a sleeve that at least extends out of the free edge of the crown and is further bound by a maximum projection of approximately 40-50% of the length L . The Examiner, on the other hand, has improperly interpreted the limitations of Sutter to include a sleeve that does not project beyond a free edge of

the cap 3 at all in an attempt to overcome the limitations of claim 18. However, as noted earlier, this interpretation is incorrect as it directly contradicts the remainder of the limitations of the distance s. It is submitted that claim 18 is allowable for at least this reason.

In the Examiner's Answer, the Examiner has further argued that the plane referred to in claim 18 is not clearly defined and has attempted to meet the limitations of claim 18 by depicting an angled plane extending from a free edge of the cap 3 to a free edge of the sleeve 7. (*See* Examiner's Answer, pp. 9 - 10). It ought to be understood, however, that in light of the principle that claims are not to be viewed in a manner that is inconsistent with the specification, the only plane that meets the one in claim 18 is a plane that includes *all* of the free edge of the crown and shell section. It is respectfully submitted that the plane depicted by the Examiner fails to account for the three-dimensional hemispherical shape of the cap 3 and merely depicts a plane of a cross-sectional view of the cap 3. When accounting for a three-dimensional view of the cap 3, there is only one possible plane that can lie along the free edge of the cap 3. It is evident that nothing in Sutter teaches or suggest that this plane is capable of being coplanar with a plane lying along a free edge of the sleeve 7. It is submitted that claim 18 is allowable over Sutter for at least this additional reason. Lakin does not cure the aforementioned deficiency of Sutter.

It is further submitted that Sutter does not teach or suggest a "shell section compris[ing] less than a hemisphere," as recited in claims 18 and 36. Rather, Sutter is explicitly directed to a

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cap 3 “whose outer surface 3a is formed in the shape of a calotte that is slightly larger than a hemisphere.” (*See* Sutter, col. 3, ll. 17 - 19; Figs. 3, 10, 11, 14). It is submitted that claims 18 and 36 are allowable over Sutter for this additional reason.

Conclusion

For the reasons set forth above, Appellants respectfully request that the Board reverse the final rejections of the claims by the Examiner under 35 U.S.C. § 103(a) and indicate that claims 18 - 36 and 40 - 42 are allowable.

Respectfully submitted,

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CLAIMS APPENDIX

1 - 17. (Canceled)

18. (Previously Presented) A prosthesis for replacing a surface of a ball of a ball-and-socket joint comprising:

a spherical shell section having an outer surface that is configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end; and

a crown that partitions the cavity of the shell section into first and second cavities adapted to receive the bone end;

wherein the shell section comprises less than a hemisphere and a free edge of the crown lies in the same plane as a free edge of the shell section.

19. (Previously Presented) The prosthesis of claim 18, wherein the spherical shell section has a height h that is about 65% to 90% of a radius of the ball.

20. (Previously Presented) The prosthesis of claim 19, wherein the spherical shell section has a height h that is about 70% to 85% of the radius of the ball.

21. (Previously Presented) The prosthesis of claim 19, wherein the spherical shell section has a height h that is about 80% of the radius of the ball.

22. (Previously Presented) The prosthesis of claim 18, wherein the first cavity has a circular shape and the second cavity has an annular shape.

23. (Previously Presented) The prosthesis of claim 18, wherein an innermost end of the crown is integrally connected to an inner surface of the shell section so as to form a single integral structure.

24. (Previously Presented) The prosthesis of claim 18, wherein at least one of an inner surface of the shell section and a surface of the crown is configured for contact with the bone end and is therefore a roughened surface.

25. (Previously Presented) The prosthesis of claim 18, wherein the crown has at least one opening formed therein to provide communication between the first and second cavities.

26. (Previously Presented) The prosthesis of claim 25, wherein the at least one opening comprises at least five openings.
27. (Previously Presented) The prosthesis of claim 18, wherein at least one of an inner surface and an outer surface of the crown has a relief structure formed as a part thereof.
28. (Previously Presented) The prosthesis of claim 27, wherein the relief structure comprises a fluting that is formed by ring beads that extend circumferentially around the crown.
29. (Previously Presented) The prosthesis of claim 18, wherein the inner surface of the shell section includes a relief structure that extends along an edge of the shell section.
30. (Previously Presented) The prosthesis of claim 29, wherein the relief structure comprises fluting formed circumferentially around the inner surface of the shell section.
31. (Previously Presented) The prosthesis of claim 18, wherein the crown and shell section are separate parts and are constructed to be securely coupled to one another.
32. (Previously Presented) The prosthesis of claim 31, wherein the crown and shell section are constructed to be threadingly coupled to one another by means of threads formed on at least

one of an outer surface of the crown and an inner surface of the shell section.

33. (Previously Presented) The prosthesis of claim 18, wherein the crown has a shape selected from the group consisting of a circle and a polygon.

34. (Previously Presented) The prosthesis of claim 18, wherein the crown is arrayed in a coaxial manner.

35. (Previously Presented) The prosthesis of claim 18, wherein the crown and shell section are individual parts and are connected to one another by a mechanical fit selected from the group consisting of screw threading, a bayonet joint and a clamping device.

36. (Previously Presented) A prosthesis for replacing a surface in a ball of a ball-and-socket joint comprising:

a spherical shell section having an outer surface configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end; and

a crown that partitions the cavity of the shell section into a first cavity and a second cavity, the first and the second cavities being adapted to receive portions of the

bone end;

wherein the shell section comprises less than a hemisphere and a free edge of the crown does not intersect a plane in which a free edge of the shell section lies.

37 - 39. (Canceled)

40. (Previously Presented) The prosthesis of claim 36, wherein the free edge of the crown is up to about 5 mm from the plane containing the free edge of the shell section.

41. (Previously Presented) A procedure for implantation of a prosthesis in a bone comprising the steps of:

preparing the bone and forming a groove in the bone;

providing a prosthesis for replacing a surface in an area of a ball of a ball-and-socket joint, the prosthesis including a spherical shell section and a crown, the shell section having an outer surface configured to lie in an articular fossa and for attachment to a surface, the shell section having a cavity for receiving a bone end, the crown partitioning the cavity of the shell section into a first cavity and a second cavity, wherein the shell section comprises less than a hemisphere and a free edge of the crown lies in the

same plane as a free edge of the shell section; and

inserting the prosthesis onto the bone such that the crown is received in the groove formed in the bone.

42. (Previously Presented) A set of prostheses comprising:

a plurality of prostheses according to claim 18, wherein the shell sections are formed having diameters that differ from one another and wherein a ratio of a height (h) of the shell section to a respective ball diameter is equal for each prosthesis and wherein a diameter of each crown amounts to the same percentage of a diameter of the spherical shell section for each prosthesis.